PHILIPS

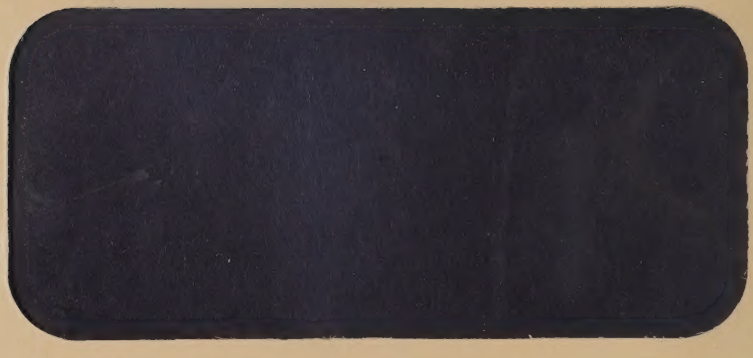
REGULATED D.C. SUPPLY

TYPE PE 4801

66 550 16.1-10 1/360

PHILIPS

DIRECTIONS FOR USE



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PE 4801

PURPOSE

The regulated D.C. supply PE 4801 is especially intended for the supply of electrical and electronic circuits in laboratories. The apparatus delivers a stabilized direct voltage, the value of which is continuously adjustable between 0 and 30 V.

TECHNICAL DATA

SUPPLY

Voltage	110	125	145	200	220	245 V (50 ... 60 Hz)
Current	310	280	245	170	160	140 mA

Power . . . . . 34 VA

OUTPUT

Direct voltage	without commutation continuously adjustable between 0 and 30 V.
Current	the instrument is rated for an coninuous output current of 300 mA max.
Stability	at a mains voltage variation of +10 or -10 %, the deviation from the output voltage is less than 0.1 % of the adjusted value or 10 mV; at a slow load variation from no load to full load or vice versa the deviation from the output voltage is less than 30 mV.
Internal resistance	static: less than 0.1 ohm at a slow variation from no load to full load or vice versa; dynamic: less than 0.25 ohm at sinusoidal load variations of 80 % of full load to full load in a frequency range from 0 to 150 kc/s.
Ripple voltage	less than 4 $mV_{r.m.s.}$
AMBIENT TEMPERATURE	35 °C max.
CONSTRUCTION	The apparatus is mounted in a grey-lacquered metal casing which is provided with feet. This makes it possible for an adequate amount of cooling air to be supplied when the apparatus is put on a table.
DIMENSIONS	Front plate: 10" x 6.8" (250 x 170 mm) Depth : 6.8" (170 mm)
WEIGHT	6 kg

PUTTING THE APPARATUS INTO OPERATION

Adjustment to local mains voltage

Viewed from the rear there is an opening in the right-hand part of the rear plate of the supply, through which the mains voltage indication can be read off. If this indication does not correspond to the value of the local A.C. mains, remove the protective cover (turn out 3 screws), pull out the voltage adapter (marked with the indications 110, 125, 145, 200, 220 and 245 V), set it to the desired voltage and press home again. Fit the cover again. It should now be possible to read the correct value through the relevant opening.

Connection

- Earth connections: The apparatus must be earthed at the rear via the earth terminal marked " ⏚ " (central earth terminal).
- The instrument should be connected to the A.C. mains via the two-pin plug of the mains cord. If desired, a two-pin plug with an extra contact for rim earthing may be fitted; the mains cord is of the three-core type.
- For tapping the stabilized output voltage, two plug sockets marked "+" and "-" are provided on the front plate, to the right. It is recommended to interconnect one of these two terminals to earth; to this end an extra plug socket marked " ⏚ " is provided between the direct voltage terminals, which is connected to the central earth terminal of the apparatus.
- In order to obtain a higher voltage than the max. output voltage (30 V) two instruments can be connected in series. The +terminal of one apparatus is then connected to the -terminal of the other apparatus. (In this case it is necessary to earth one of the four terminals).

Protection

- The D.C. output circuit is protected by means of a 315-mA safety fuse. This fuse is found at the front of the apparatus and is marked " ⎓ ".
- The A.C. circuit is protected by means of a 200-mA safety fuse with delayed action. This fuse is found at the front of the apparatus and is marked " ~ ". The fuse is chosen for mains voltages of 200, 220 and 245 V; for lower mains voltages (110, 125 and 145 V series) a delayed action safety fuse of a higher value is to be used, namely 400 mA.

Cooling: Before switching on the apparatus, make sure that the natural cooling is not impeded.

OPERATION

The supply is switched on by sliding the switch Sk1 (left on the front plate) to the right (position marked " ~ ").

Adjustment of the output voltage

The adjustment of the direct voltage is effected by means of the knob marked "V" (right on the front plate); adjusting range 0 ... 30 V.

Reading of the voltage
The output voltage can be read from the voltmeter (dial 0 ... 30 V).

Switching off takes place by sliding switch Sk1 to the left (position marked "0").

WORKING

The regulated D.C. supply is witched on by means of switch Sk1, after which the mains voltage is supplied to transformer T1 via the voltage selector Sk2.
The secondary alternating voltage of transformer T1 is rectified by the diodes Gr1 and Gr2 and subsequently smoothed. This rectified voltage then passes to the output terminals of the apparatus via the series transistor Ts1.

The control is brought about as follows:
The negative basis/emitter voltage of the transistor Ts12 is directly influenced by a change that may occur in the difference between the reference voltage (see bottom of page) and the output voltage. When the output voltage rises (e.g. owing to a decrease of the load) the basis of Ts12 will become more negative as regards the emitter and the colledtor current and thus the loss of voltage across R12 will increase as a result. This has the result that the bases of Ts10 and Ts11 become less negative and a smaller collector current of Ts10 and Ts11 and a smaller loss of voltage across R14 is consequently caused. The result of this is that the basis of Ts1 becomes less negative, due to which the collector current of Ts1 decreases and the voltage across the load drops. This drop accordingly causes a decrease in voltage at the output of the stabilizer, which will counterbalance the original rise. When the output voltage falls, control is effected in the opposite way.

The reference voltage
The a.c. voltage which comes from the secondary winding S3 of T1 is rectified by Gr3, further smoothed by C2 and stabilised by tube B1 (85A2). Mains voltage variations are offset by means of the resistors R19 and R20. Part of the constant voltage thus obtained is used as a reference voltage and is adjustable by means of the resistor R3 (The adjustment of R3 thus determines the size of the output voltage).

PARTS LIST

This list of parts may be subject to future alterations.

REGULATED D.C. SUPPLY PE 4801

Reference	Description	Number
T1	Feeding transformer	1
L1	Choke	1
Gr1 and Gr2	Silicon diodes OA 210	2
Gr3	Selenium unit B250C75	1
B1	Stabiliser valve 85 A2	1
Ts1	Transistor OC 36	1
R1	Resistor 8W 1000 ohms	1
R2	Resistor 1W 1800 ohms	1
R3	Resistor 3W 10000 ohms	1
C1	Capacitor 250 + 250 µF 50 V	1
C2	Capacitor 25 + 25 µF 350 V	1
Sk1	Sliding switch, 2-pole	1
Sk2	Change-over switch	1
VL1	Safety fuse 200 mA delayed act.	1
VL2	Safety fuse 315 mA	1
V1	Moving-coil meter 30 V	1
Vd	Printed wiring unit	1

PRINTED WIRING UNIT

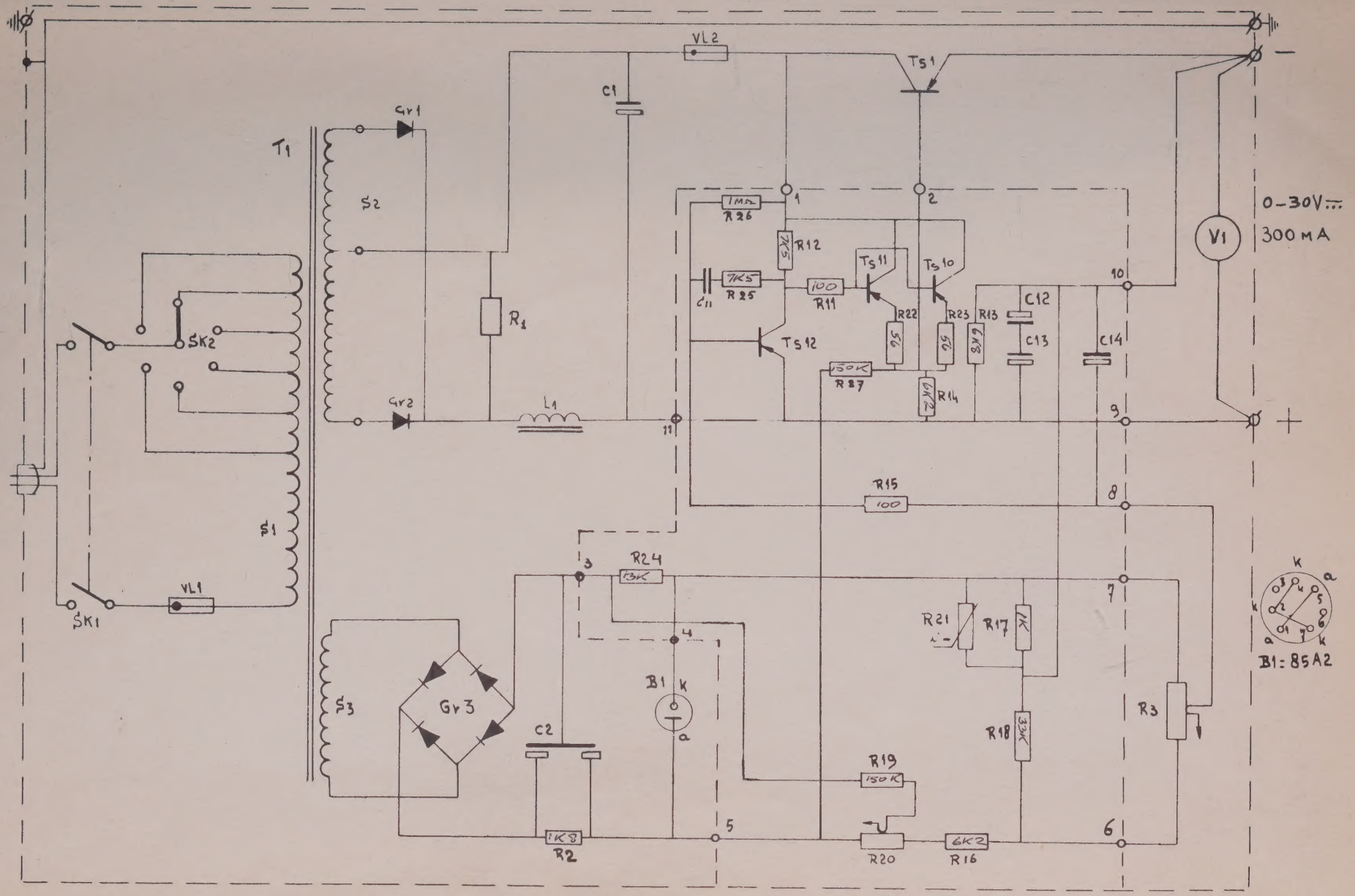
Reference	Description	Number
R11	Resistor 0.25 W 100 Ω	1
R12	" 1 W 7,500 Ω	1
R13	" 0.25 W 6,800 Ω	1
R14	" 0.25 W 6,200 Ω	1
R15	" 0.25 W 100 Ω	1
R16	" 0.5 W 6,200 Ω	1
R17	" 0.25 W 1,000 Ω	1
R18	" 0.25 W 33,000 Ω	1
R19	" 0.5 W 0.15 MΩ	1
R20	" 1 W 5,000 Ω	1
R21	NTC-resistor 15,000 Ω	1
R22	Resistor 0.25 W 56 Ω	1
R23	" 0.25 W 56 Ω	1
R24	" 5.5 W 13,000 Ω	1
R25	" 0.25 W 7,500 Ω	1
R26	" 0.25 W 1 MΩ	1
R27	" 0.25 W 0.15 MΩ	1

Reference	Description	Number
C11	Capacitor 1500 µF	1
C12	" 64 µF 40 V	1
C13	" 64 µF 40 V	1
C14	" 10 µF 40 V	1
Ts10	Transistor type OC 77	1
Ts11	Transistor type OC 77	1
Ts12	Transistor type OC 77	1

NOTE

When ordering new parts always state:

1. The type number of the apparatus;
2. The reference and any further data such as they are indicated for the part concerned on the diagram and in the list of parts.


VL2
Ts1
C1
Gr1
T1
S2
Gr2
R1
L1
SK2
S1
SK1
VL1
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1
2
TMΩ
R26
7K5
R25
C11
R12
100
R11
Ts11
Ts10
Ts12
R22
R23
R13
C12
C13
C14
150K
R27
R14
10
9
8
R15
100
3
R24
13K
4
7
R21
R17
1K
B1
K
a
S3
Gr3
C2
1K8
R2
5
R19
150K
R20
6K2
R16
R18
33K
R3
6
V1
0-30V⎓
300 mA
K
a
B1: 85A2

PE 4801

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